Rolling Blackout Reduction Program

Communications & Control Systems
for
Distributed Energy

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Presented by:
Susie E. Sides
Demand Response Programs Manger
San Diego Gas & Electric
(858) 654-1186
ssides@semprautilities.com

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Agenda

- Recap California Energy Crisis
- Describe Rolling Blackout Reduction Program
  - Purpose
  - Operations
  - Communications
  - Monitoring
  - Results
- Challenges
- Lessons Learnned
- Opportunities

History

- Summer 2000
  - SDG&E customers exposed to market prices
    - Electric energy costs increased 300%
- November 2000 – July 2001
  - Supply shortages resulting in state emergencies
  - Interruptible loads called upon for nearly 90 hours
  - CA ISO forecast: 200 hours of rolling blackouts in 2001
- Summer 2001
  - Seven (7) Demand Response Programs (DRPs) approved
    - Approved April 29, 2001
    - To be implemented by June 1, 2001
  - DRPs not needed as expected
    - 8-10% voluntary conservation
    - Milder weather
    - New generation

Rolling Blackout Reduction Program (RBRP)

- Unique up in California to San Diego
- Utilizes customers' back-up generators (BUGs)
- Overwhelming response from all stakeholders
  - Business Associations
  - Air Pollution Control District
  - Elected Officials
- Offers a financial incentive
    - $0.20/kWh of load reduction
- Benefits the entire community
- Simple to implement

Purpose

- Maintain system reliability
  - Reduce the impact of rolling blackouts
    - Blackouts may not be completely eliminated
- Allow businesses to stay in business
  - Limits the negative impact on operations
- Operates as a "resource of last resort"
  - Initiated just prior to firm load curtailment
  - Meets Air Quality requirements

Participant Requirements

- Business (non-residential) customers only
- Ability to reduce 100kW or 15% of maximum demand, whichever is greater
- Ability to utilize a Back-up Generator (BUG)
- Applicable in San Diego Air Pollution Control District (APCD) area only

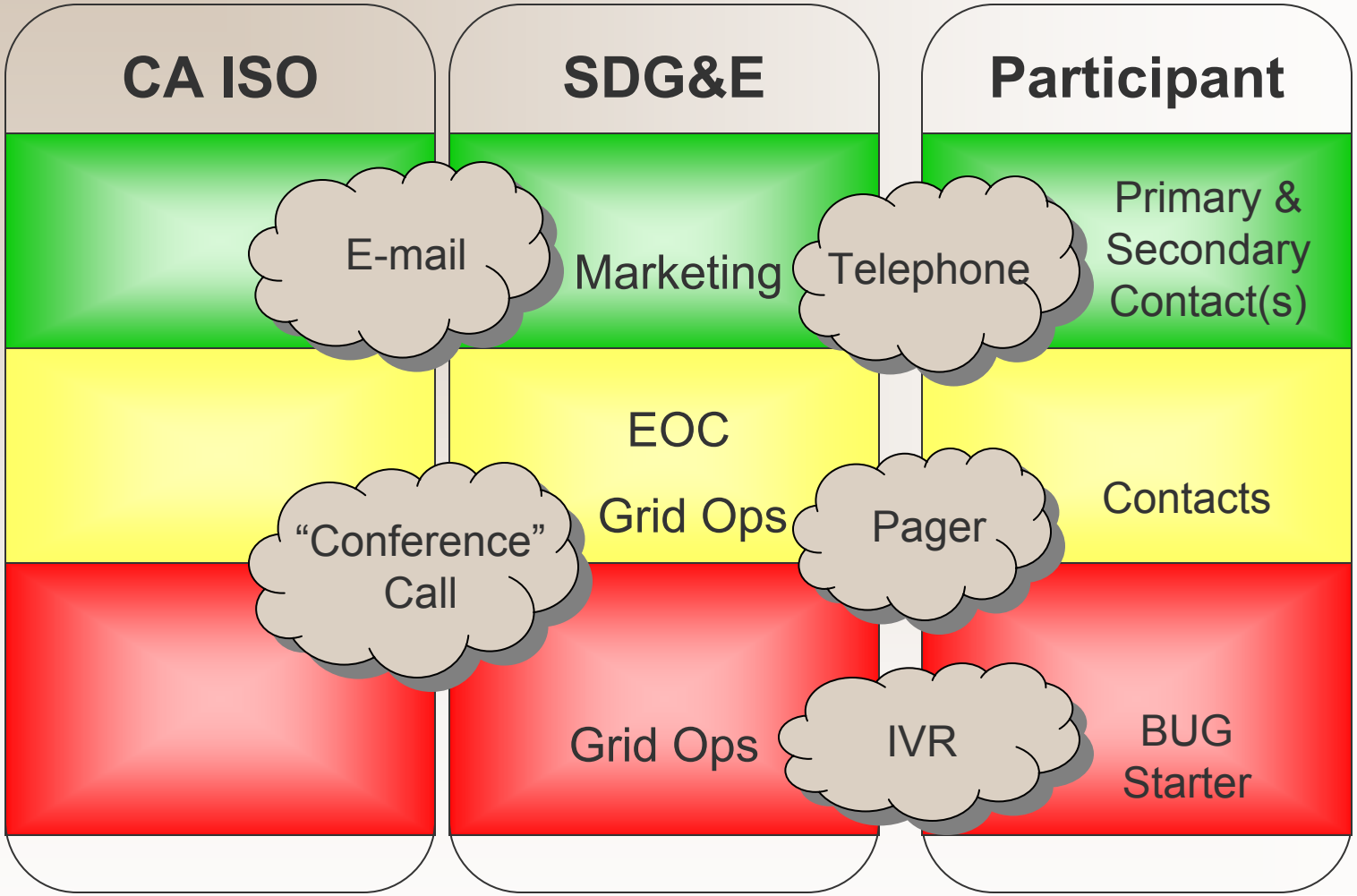
Marketing and Recruitment

- Identify potential participants
  - APCD BUG permits and/or Account Executives
  - Segment by BUG size (minimum 100kW)
- Promote program
  - Customer meetings (primary)
  - Workshops (secondary)
- Conduct site survey
  - Verify load reduction capability
  - BUG location
- Sign agreement
  - Confirms pledged load reduction
  - Provides customer contact information
- Maintain DRP database
  - Participant information
  - Pledged load reduction data
  - Reporting requirements
  - Post-settlement data

Event Notification Process

- CA ISO: Pre-Stage Emergency
  - SDG&E calls participants to advise of potential for RBRP
  - Participants provide estimated potential load reduction
  - SDG&E includes this estimate in available load reduction
- CA ISO: Pre-Stage 3 Emergency
  - SDG&E initiates "Pre-Alert" via 2-way pager to participants
  - Participants respond via pager with "Yes" or "No"
- CA ISO: Stage 3 Emergency
  - SDG&E initiates RBRP via 2-way pager
  - Participant responds via Interactive Voice Response (IVR)
  - Participant shifts load to Back-up Generator (BUG)
    - Within 15 minutes of notification

Communications Channels



BUG Operations

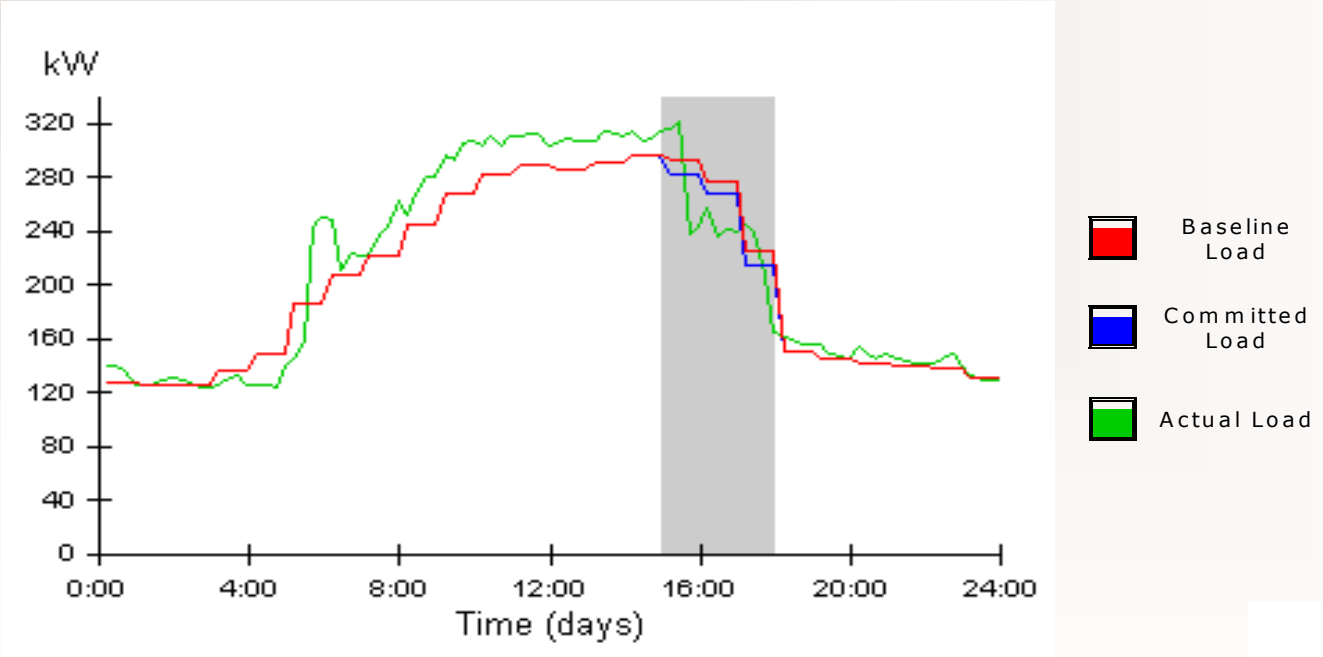
- BUG operation
  - May operate in parallel for up to 60 cycles (1 minute)
    - Minimizes service interruption during transfer
  - Start BUG within 15 minutes of event initiation
  - Discontinue BUG within 30 minutes after event termination
- Environmental dispatch
  - Notification based upon BUG emissions
  - Lower emissions assigned higher priority
- Load reduction monitoring
  - BUG load tracked every 5 minutes
  - Facility load tracked every 20-35 minutes

Load Reduction Monitoring

- BUGs > 300kW
  - Generation Output (GO) meters installed
  - Monitored every 5 minutes
    - On-line tool to view load reduction
- BUGs < 300kW
  - Site visits by SDG&E technicians during events
    - Verify generator load
    - Report to Grid Operations
- Facility Load
  - Monitored every 20-35 minutes
  - Participants can view load served by grid

On-line Load Reduction View

Program Name:	RBRP
Account ID:	9999999999
Account Name:	Test Account 2
Curtailable Load:	100 kW
Event Time Start:	3:00 PM
Event Time End:	6:00 PM
Date of event:	7/10/2002



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Results

- Participation Levels
  - 2001: Nearly 76MW in pledged load reduction
    - Height of energy crisis – concern for blackouts
  - 2002: Nearly 60MW in pledged load reduction
    - Temporary BUGs returned – blackouts less likely
    - 59 sites representing 33 customers
      - 27 GO meters installed
- RBRP has not been initiated
  - Stage 3 emergencies have been avoided
- RBRP extended through early 2004

Challenges

- Implementation Schedule
  - CPUC Approval – May 2001
  - Implementation – June 2001
- Marketing & Recruitment
  - Sense of urgency
  - Promoting an "Insurance Policy"
- Technology
  - Communications protocol
    - Online tool; paging system; IVR
  - Load reduction verification
- Regulatory
  - APCD support
  - CPUC approval
  - CA ISO coordination

Lessons Learned

- Remember the CUSTOMER
  - What's in for them? Not us.
  - Understand the impact on business operations
  - Customers participate to help community
    - Reliability in primary
    - Financial incentives are secondary
  - Allow sufficient time to market the program
- Keep it SIMPLE
- Conduct periodic testing
  - Maintain communications and initiation process
  - Interdepartmental coordination
- Understand information requirements
  - Identify the need and timing – then select technology

DR as DER?

- Existing DR programs are voluntary
  - Load reductions are not secure
  - Reduction levels could vary significantly
    - Time of event could affect reduction levels
- Existing DR programs are new
  - No history of participation levels
    - Monthly tests reveal about 20MW may be available
      - Load reduction derived from multiple circuits
    - Difficult to quantify for resource planning

Opportunities

- Enhanced Automation & Controls
  - Pros: Increased likelihood of load reduction
  - Cons: Customers still want to be in control
- Improved Communication Channels
  - Pros: Reduce management of various technologies
  - Cons: Sometimes the phone is the best technology

THANK YOU